

### **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **LISTING OF THE CLAIMS**

1. **(currently amended)** A method of forming a microporous ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) sheet, comprising the steps of:

irradiating a sheet of ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) with electrons at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the ~~fluoropolymer~~ polytetrafluoroethylene (PTFE), but sufficient to rupture carbon-to-carbon (C-C) bonds; and

exposing the entire sheet of ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) to an etchant for a period of time sufficient to etch away disrupted atoms and molecules, wherein continuous micropassages are formed through said sheet.

2. **(original)** A method as defined in claim 1, wherein said dose level is between 5 kGy and 50 kGy.

3. **(currently amended)** A method as defined in claim 2, wherein said sheet of ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) has a thickness between 1 and 15 mm.

4. **(currently amended)** A method as defined in claim 1, wherein said step of irradiating comprises moving a generally continuous film of ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) past a stationary source of electrons.

5. **(original)** A method as defined in claim 4, wherein said source of electrons is an electron beam from an electron accelerator.

6. **(currently amended)** A method ~~as defined in claim 4~~, of forming a microporous fluoropolymer sheet, comprising the steps of:

irradiating a sheet of fluoropolymer at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the fluoropolymer, but sufficient to rupture carbon-to-carbon (C-C) bonds by moving said sheet of fluoropolymer past a stationary source of electrons, wherein said source of electrons is comprised of a target material exposed to x-rays; and

exposing the sheet of fluoropolymer to an etchant for a period of time sufficient to etch away disrupted atoms and molecules, wherein continuous micropassages are formed through said sheet.

7. **(currently amended)** A method ~~as defined in claim 4~~, of forming a microporous fluoropolymer sheet, comprising the steps of:

irradiating a sheet of fluoropolymer at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the fluoropolymer, but sufficient to rupture carbon-to-carbon (C-C) bonds by moving said sheet of fluoropolymer past a stationary source of electrons, wherein said source of irradiation is an isotope; and

exposing the sheet of fluoropolymer to an etchant for a period of time sufficient to etch away disrupted atoms and molecules, wherein continuous micropassages are formed through said sheet.

8. **(original)** A method as defined in claim 1, wherein said dosage level is between 5 kGy and 20 kGy.

9. **(original)** A method as defined in claim 1, wherein said etchant is a liquid.

10. **(currently amended)** A method as defined in claim 9, wherein said etchant is selected from the group consisting of sodium, ~~or other chemical solutions, such as ethylene~~

glycol dimethyl ether (MONOGLYME), diethylene glycol dimethyl ether (DIGLYME) or tetraethylene glycol dimethyl ether (TETRAGLYME).

11. **(currently amended)** A method ~~as defined in claim 1,~~ of forming a microporous fluoropolymer sheet, comprising the steps of:

irradiating a sheet of fluoropolymer at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the fluoropolymer, but sufficient to rupture carbon-to-carbon (C-C) bonds; and

exposing the sheet of fluoropolymer to an etchant for a period of time sufficient to etch away disrupted atoms and molecules, wherein continuous micropassages are formed through said sheet, and wherein said etchant is a gas.

12. **(original)** A method as defined in claim 11, wherein said etchant is fluorine.

13. **(currently amended)** A method ~~as defined in claim 1,~~ of forming a microporous fluoropolymer sheet, comprising the steps of:

irradiating a sheet of fluoropolymer at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the fluoropolymer, but sufficient to rupture carbon-to-carbon (C-C) bonds; and

exposing the sheet of fluoropolymer to an etchant for a period of time sufficient to etch away disrupted atoms and molecules, wherein continuous micropassages are formed through said sheet, and wherein said sheet of fluoropolymer is one of several sheets simultaneously exposed to said electrons.

14. **(original)** A method as defined in claim 13, wherein said several sheets of fluoropolymer are layered one on another into a stack and said electrons radiate through said stack.

15. **(currently amended)** A method ~~as defined in claim 1,~~ of forming a microporous fluoropolymer sheet, comprising the steps of:

irradiating a sheet of fluoropolymer at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the fluoropolymer, but sufficient to rupture carbon-to-carbon (C-C) bonds; and

exposing the sheet of fluoropolymer to an etchant for a period of time sufficient to etch away disrupted atoms and molecules, wherein continuous micropassages are formed through said sheet, and wherein said irradiated fluoropolymer sheet is etched in a liquid etchant within an electric field that produce an electrophoresis effect in said liquid etchant.

16. **(currently amended)** A method as defined in claims ~~[[1, 2, 3, 4,]]~~ 6, 11, [[12,]] 13 or ~~[[14]]~~ 15, wherein said fluoropolymer is polytetrafluoroethylene (PTFE).

17. **(currently amended)** A method ~~as defined in claim 1,~~ of forming a microporous fluoropolymer sheet, comprising the steps of:

irradiating a sheet of fluoropolymer at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the fluoropolymer, but sufficient to rupture carbon-to-carbon (C-C) bonds; and

exposing the sheet of fluoropolymer to an etchant for a period of time sufficient to etch away disrupted atoms and molecules, wherein continuous micropassages are formed through said sheet, and wherein said step of irradiating occurs with an oxygen-bearing medium supplied to an area where said fluoropolymer sheet is irradiated.

18. **(original)** A method as defined in claim 17, wherein said oxygen-bearing medium is a fluid.

19. **(original)** A method as defined in claim 18, wherein said oxygen-bearing medium is water.

20. **(original)** A method as defined in claim 19, wherein said water is sprayed onto said fluoropolymer sheet.

21. **(original)** A method as defined in claim 17, wherein said oxygen-bearing medium is a gas.

22. **(original)** A method as defined in claim 21, wherein said gas is oxygen.

23. **(original)** A method as defined in claim 17, wherein said fluoropolymer is polytetrafluoroethylene (PTFE).

24. **(original)** A method as defined in claim 1, wherein said sheet is a generally continuous film having a thickness between about 10 $\mu$ m (microns) and 200 $\mu$ m (microns), and said film is continuously conveyed past a stationary source of irradiation.

25. **(original)** A method as defined in claim 24, wherein said film is conveyed through an etchant following said irradiation step.

26. **(currently amended)** A method as defined in claim 1, wherein said sheet has a thickness of about 10 $\mu$ m (microns) ~~[[and]]~~ to about 15 mm, and said sheet is irradiated and etched as an individual piece.

27. **(currently amended)** A method of forming a microporous ~~fluoropolymer~~ polytetrafluoroethylene (PTFE), comprising the steps of:

irradiating a ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) material at a dosage level below the rupture energy of the carbon-to-fluorine (C-F) bonds of the ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) material, but sufficient to rupture carbon-to-carbon (C-C) bonds;

exposing said ~~entire fluoropolymer~~ polytetrafluoroethylene (PTFE) material to an etchant for a period of time sufficient to etch away disrupted atoms and molecules within said material; and

removing said ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) material from said etchant when continuous micro-passages are formed through said ~~fluoropolymer~~ polytetrafluoroethylene (PTFE) material.

28. **(canceled)**

29. **(currently amended)** A method as defined in claim ~~[[28]]~~27, wherein said polytetrafluoroethylene (PTFE) is a sheet having a thickness between about 10 $\mu$ m and 30 mm.

30. **(original)** A method as defined in claim 29, wherein said sheet is a film having a thickness between about 10 $\mu$ m and 200 $\mu$ m.

31. **(currently amended)** A method as defined in claim ~~[[28]]~~27, wherein said polytetrafluoroethylene (PTFE) is irradiated from a single source.

32. **(canceled)**